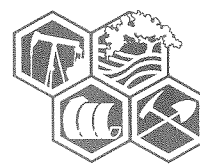
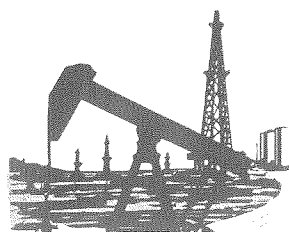


# SMARA UPDATE



The Quarterly Newsletter of the Department of Conservation - Office of Mine Reclamation



## Oil and Gas Exemption Added to SMARA

Effective Jan. 1, 1997, certain activities associated with oil and gas operations will be statutorily exempt from the provisions of SMARA. Sen. Dick Monteith's (R-Modesto) SB 1549 (Chapter 616, Statutes of 1996), adds subdivision "k" to the SMARA exemptions found in Public Resources Code Section 2714. Specifically, any excavations, grading, or other earthmoving activities in an oil or gas field that are integral to, and necessary for, ongoing operations for the extraction of oil or gas would be exempted, *if*

- the operations are regulated in accordance with Division 3 (of the PRC),

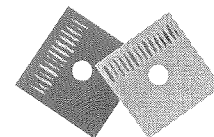
- the operations are consistent with any applicable general plan or zoning,
- the earthmoving activities are located within oil or gas field properties under a common owner or operator, and
- no excavated materials are sold for commercial purposes.

Like the timber exemption, the oil and gas activities described are already separately regulated under another statute. In this case, it is the Department of Conservation's Division of Oil and Gas that regulates oil and gas operations. This exemption removes any unnecessary duplication of regulation of such activities.



updated edition incorporates information on the location of 917 mines or

quarries in California reported to have produced mineral commodities during 1994-95. Known as SP 103, the publication also includes information on commodities produced, mine names, names of operators, addresses and telephone numbers. It was compiled by DMG in cooperation with the Office of Mine Reclamation. A mines map is included. SP 103, together with the mines map, is available for purchase from DMG for \$30.



The digital database containing this list is available on a 3.5" computer diskette for \$25, formatted as either a Delimited ASCII Text file (ca95mine.txt) or as a dBASE file (ca95mine.dbf). However, the diskette does not come with the mines map. The accompanying mines map may be purchased separately for \$5. For information about purchasing SP 103, the diskette and/or the mines map, contact DMG Publications at 801 K Street, MS 14-34 Sacramento, California 95814, telephone (916) 445-5716.

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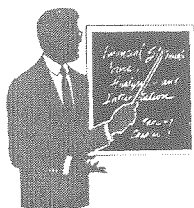
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## DMG Releases Updated Active Mines List

The Department's Division of Mines and Geology has announced the release of its' *Mines and Mineral Producers Active In California*. This

## Reclamation Workshops Continue

OMR continues to provide training to local, state and federal agency personnel in the implementation of SMARA's reclamation requirements at a series of workshops planned through the spring. As reported in the last issue of the *SMARA Update*, a series of 10 one-day workshops were initially planned. To date, five have been completed. Information on what to look for in a reclamation plan, determining the applicability of SMARA exemptions, reviewing reclamation cost estimates and financial assurance mechanisms, and an overview of compliance issues is provided in this initial series of "overview" workshops.



*Workshop dates planned for the first part of 1997 are as follows:*

Jan 7	Sacramento
Mar 6	Riverside
Mar 13	San Jose
Apr 23	Merced
Apr 24	San Luis Obispo

Evaluation forms completed by workshop participants provide useful feedback and enable OMR to make changes to the presentations as indicated. We are pleased to report that for the most part, participants have felt the introductory series to be worthwhile. As can be expected, there has been interest expressed in followup workshops focussed on specific topics. Feedback gathered from these forms will serve to help

OMR plan for a smaller number of focussed workshops next fiscal year.

Not surprisingly, the liveliest workshop discussions thus far have revolved around interpretations of the SMARA exemptions. Because there has been such a keen interest in this subject, OMR is considering development of a series of "scenario" columns for inclusion in future issues of the *SMARA Update* in an effort to further assist local agencies. Your suggestions for topic coverage would be most welcome; contact the editor, Deborah Herrmann, at telephone (916) 322-2089 with comments or questions.

## Revegetation of Sulphur Bank Mercury Mine

*Editor's Note: The Department of Conservation has expertise in revegetation of mined lands, and is currently studying the potential for remediation of toxic sites through use of soil amendments and native species. The following is a technical presentation describing OMR's efforts to revegetate the Sulphur Bank Mine, an EPA-listed Superfund site.*

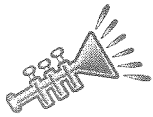
Sulphur Bank Mercury Mine is situated in the Oaks Arm of Clear Lake in the Clear Lake Basin, Lake County, California. The basin is dominated by Mt. Konocti, a dacite stratovolcano. The mine is at the intersection of three faults and shear zones at the center of a pipeline zone of hydrothermal alteration. Upwelling hot springs and fumaroles were observed during mining operations from 1865 to 1957 and can be observed at present. Mercury is significantly elevated in shallow sediments of the Oaks Arm of Clear Lake. Random surficial soil samples have revealed high levels of mercury and arsenic in tailings within the mine. Elevated mercury levels and the

potential threat to human health have resulted in the classification of the Sulphur Bank Mine as a Superfund Site. The mine encompasses approximately 150 acres, including about 120 acres of mine wastes and tailings and the 23-acre Herman Pit, known as the Herman Impoundment. The Herman Impoundment is approximately 90 feet deep, with vertical walls. Mine tailings descend from the surrounding slopes into the pit. Tailings extend into Clear Lake from the western portion of the mine.

Ore deposition was primarily by geothermal springs in fissures and cavities of volcanic rock with major areas of cinnabar deposition along the projections and intersections of the fault zones. Crystalline cinnabar was found primarily as veinlets and dendrites in kaolinized sediments, in the clays between the boulders of andesite, and in altered andesite. Elemental mercury (quicksilver) was also reported in the two of the mine pits. Greatest hydrothermal activity and alteration was reported in the east end of the Herman Pit. The hydrothermal springs were below the level of Clear Lake and received water inflowing from Clear Lake. Geothermal springs also vent from the floor of Clear Lake. Mining activity at Sulphur Bank Mercury Mine concentrated primarily in the andesite boulder zone. During the mining period, vertical shafts were excavated to depths greater than 1000 feet below the surface elevation. These shafts were abandoned due to upwelling geothermal waters.

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"Revegetation of Sulphur Bank Mercury Mine" is offered this issue in lieu of "Reclamation Tips." The Reclamation Tips column will return in the spring issue of the *SMARA Update*.



## Governor Appoints New Department Director

Gov. Pete Wilson has appointed **Lawrence J. Goldzband** director of the Department of Conservation.

Mr. Goldzband, of San Francisco and previously of La Mesa, has been the regulatory affairs director for San Diego Gas & Electric Co. since 1995, and currently serves on the San Francisco Bay Conservation and Development Commission, a regional planning agency responsible for protecting the bay and its shoreline.

Prior to working for SDG&E, Mr. Goldzband served as chief deputy cabinet secretary for Gov. Wilson from 1991 to 1993, where he directed policy development and implementation in the areas of commerce, transportation, natural resources, environmental protection and energy. He also served as a legislative and executive assistant for then-Sen. Pete Wilson from 1986 to 1990 and as a legislative assistant for U.S. Rep. Bill Green (R-New York) from 1983 to 1986.

Mr. Goldzband is a graduate of the Coro Foundation (1981-82), where he was one of 36 Fellows nationwide who consulted in public affairs for private sector, labor and governmental clients. He holds a bachelor's degree in government from Pomona College and a master's degree in management from the J.L. Kellogg Graduate School of Management, Northwestern University, Evanston, Illinois. He will start his new position effective Jan. 6, 1997.

## Compliance Corner

The Office of Mine Reclamation assigns a California Mine Identification Number (ID#) when the first Mining Operation Report (Annual MRRC-2 or New MRRC-3) is received. The ID# remains the same despite any changes such as ownership or mine name. OMR uses the ID# in processing reports, maintaining records and in correspondence. The ID# is the key element in the SMARA database system.

The CA Mine ID# is easy to interpret once the sequencing is understood. For example, CA Mine ID# 91-01-0001 would be translated as follows:

### 91

All mine ID#'s begin with this number, which denotes the year the reporting program started.

### 01

Represents a numerical identification of county lead agencies.

### 0001

Mine number delineated by the order in which the report was received.

Mines located within a city lead agency are not given a distinguishing "city" number; they are identified by county.

Although OMR stresses the importance of including the ID# on documents, many documents are still received without a specific ID#. Matching documents without ID#s to the correct mine file is time consuming, and may result in delays with processing important documents. While the indication of a mine name is useful in finding a link to the record, its use alone is not foolproof, especially when there is another mine with the same name.

Proper use of the ID# will result in a more efficient use of staff resources. OMR appreciates your efforts to use the ID# system; those who haven't should begin to do so. Should there be a need to verify a CA Mine ID#, OMR can be contacted at (916) 323-9198.

Amy Vong  
Assistant Compliance Technician

### Revegetation of Sulphur Bank Mercury Mine

(Continued from page 2)

A 1992 report to the U.S. Environmental Protection Agency indicated that elevated levels of mercury and arsenic occur throughout the mine and surrounding area. Organic and inorganic forms of mercury compounds can cause toxicity by both acute and chronic exposure. Methylmercury is known to bioaccumulate in fish and other aquatic organisms; longterm ingestion by humans can result in prolonged toxicity. Arsenic is considered to be a carcinogen. Paths of exposure are by oral ingestion and dust inhalation.

EPA initiated remediation of the mine under its emergency authority in May 1992. At that time, unvegetated tailings lining the shore of Clear Lake were actively eroding into the lake. The EPA regraded the waste piles and placed a layer of imported topsoil on the tailings. The tailings were seeded with an erosion control mix. The toe of the tailings pile at the lake was rip-rapped with large boulders to minimize wave run-up. Willow seedlings were also planted.

The EPA originally proposed draining, treating, and disposing of the acid water filling the Herman Impoundment, backfilling the pit with excavated mine wastes, regrading and revegetating the mine area, and capping with clean soil as necessary to support vegetation and to meet California mining waste management requirements. To do this would remove vegetation established since cessation of mining and mobilize more sediments throughout the area.

Vegetation at Sulphur Bank Mercury Mine is a complex mosaic due to human alteration of historic vegetation, site geology, and microclimate differences resulting from slope and exposure. A diversity of native plants occur at the mine, having established on tailings and overburden, indicative of the revegetation potential of the mine. The native plants are adapted to the acidic, rocky or clay-rich soils of the site, adaptations in response to geochemical conditions at the site.

Blue oak (*Quercus douglasii*) is codominant with one or more canopy associates: foothill pine (*Pinus sabiniana*), interior live oak (*Quercus wislizenii*), black oak (*Quercus kelloggii*), and a hybrid scrub oak (*Quercus* c.f. *berberidifolia*). The understory is variously dominated by shrubs or herbaceous species and grasses, including common manzanita (*Arctostaphylos manzanita*), yerba santa (*Eriodictyon californicum*), coyote brush (*Baccharis pilularis*), western redbud (*Cercis occidentalis*), toyon (*Heteromeles arbutifolia*), bush monkeyflower (*Mimulus aurantiacus*), blackberry (*Rubus discolor*), and blue wild-rye (*Elymus glaucus*). Small, open meadows of nonnative annual grasses are also common. Of principal interest to us was the vegetation dominated by the hybrid shrub oak, which we refer to as *Quercus berberidifolia*. The scrub oak hybrid is the predominant species on mine tailings and overburden. Oak seedlings can be observed growing in otherwise barren tailings and overburden. Soils in which these seedlings are found have a pH of 3.



Herman Impoundment at Sulphur Bank Mercury Mine.

Photo courtesy of MaryAnn Showers

Working under contract with the EPA and the California Department of Toxic Substances Control, the Office of Mine Reclamation proposed to develop a revegetation strategy for the mine that would conserve established vegetation, eliminate or reduce the amount of imported soil cover required,

minimize potential mobilization of contaminated sediments or runoff into Clear Lake, and retain a local source of plant propagules. The focus of the revegetation study is on relatively bare areas of the mine. Because native species are growing on site, OMR is attempting to assess site conditions that are favorable to plant establishment.

Twenty-six soil samples from tailings and waste rock piles, as well as those from undisturbed areas (native soils) were analyzed for nutrient levels and soil pH. These baseline data provided a range of pH values for the site. Soil pH for baseline samples ranged primarily from pH 2.0 to pH 4.4. Three samples had pH levels of 6.4, 6.8, and 7.4. The pH of one sample, pH 5.7, approximated that of native soils.

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## Revegetation of Sulphur Bank Mercury Mine

*Continued from page 4*

OMR collected seed from site-indigenous plants.

Revegetation test plots were installed in two areas of the mine: on the Clear Lake shoreline tailings pile (Shoreline) and on tailings and waste in the northeast portion of the mine (Tailings). Selection of the two sites, considered representative of substrate conditions over large portions of the mine, was based on cluster analysis of soils analysis. Soils at the mine are primarily mineral soils with low levels of organic material.

Test plots were designed in two phases. Test plots were installed in a completely randomized block design for statistical analysis. Phase I test plots were installed on each type of mine waste and contrasted four different treatments: 1) waste lime only (L), 2) organic compost only (O), 3) waste lime + organic compost (L/O), and 4) no treatment (C - control). Phase I plots were used to equilibrate levels of amendments applied to the plots. Phase II test plots will use plants grown from site-collected seed. Scrub oak, foothill pine, toyon, and coyote brush used in the Phase I plots were purchased from commercial suppliers. Where possible, plants propagated from materials within the same general climatic and elevational range as the mine were used. Seed collected from deerweed (*Lotus scoparius*), toyon, blue wild-rye, and scrub oak growing on the mine were also planted.



California Conservation Corps members preparing revegetation test plot. *Photo courtesy of MaryAnn Showers*

During the Phase I experiments, an attempt was made to amend soils to a pH of approximately pH 5.5 -pH 6.0, levels similar to those found in undisturbed native soils. To reach a pH of 5.5, the amount of waste lime required is estimated at 12.6 tons of lime per acre ( $\text{CaCO}_3$ , equivalent per acre) incorporated into the upper six inches of substrate. This lime application raised the pH in the shoreline treatment area to pH values ranging from 6.4 to 7.3. For the east tailings treatment area, amended values ranged from pH 3.1 to 6.3. For the organic treatment plots,

the equivalent of approximately 30 tons compost per acre was incorporated into the upper twelve inches of growth media.

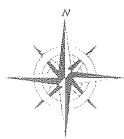
OMR collected baseline data when plants were first installed, followed by measurements during and after the growing season. Plant volume was calculated to determine plant growth. Two types of measurements were analyzed: 1) a comparison of the growth of all species for each soil treatment, and 2) a comparison of each species performance across all soil treatments. Analysis of growth data indicates that plants installed on the LIME and L/O treatments outperformed plants grown on O and control. The differences are statistically significant.

<u>Species</u>	<u>Shoreline</u>	<u>Tailings</u>
Coyote brush	L, L/O>C;O	L>C
Toyon	L/O>C	L, L/O>C;O
Foothill pine	No difference	No difference
Scrub oak	No difference	L/O>C

On all of the Tailings soils treatments, toyon consistently had the largest increase in growth over baseline. In comparing the different soil treatments for individual species, coyote brush growth with lime was significantly greater than growth of the control plants. Growth with lime/organic was not significantly different than growth under lime alone. Similar results were achieved for toyon. There were no significant differences in foothill pine growth under any of the treatments. For scrub oak, greatest growth occurred

with the lime/organic treatment. Results were more varied for the Shoreline treatment area. On Shoreline control plots, coyote brush and toyon growth were greater than that of pine and oak. When lime was added to the soil, coyote brush growth increase was significantly larger than that of the other species. With the addition of lime/organic and organic, toyon growth also increased significantly over baseline. For between species tests, greatest coyote brush growth was achieved with the addition of lime or

*Continued on page 6*



## Executive Officer's Report

*At its Nov. 13 scheduled meeting held in Sacramento, the State Mining and Geology Board took the following actions:*

- Acknowledged mineral resource management policies proposed by the cities of Santa Maria and Lake Forest as being in compliance with SMARA and board regulations. A local agency with classified mineral lands within its jurisdiction is required by SMARA to develop mineral resource management policies for incorporation within the agency's general plan; SMARA requires the board to review such policies prior to lead agency adoption.

- Adopted the reclamation plan and mitigation monitoring program for RMC Lonestar's Bonny Doon Quarries located in Santa Cruz County. RMC had appealed to the board for approval of its reclamation plan based on prima facie evidence of inaction on the part of the lead agency to approve the reclamation plan prior to a June 1990 SMARA deadline.

- Approved regulatory language amending CCR § 3696 et

seq., setting annual mine reporting fees for the first time by the nonemergency method provided under new provisions of Public Resources Code §2207. Under the proposed regulation, annual reporting fees would be calculated using a formula based on production. The language will be placed in a rulemaking package and circulated for public comment this winter. PRC §2207 was amended by the Legislature in late 1996 to allow for the nonemergency setting of these fees; these proposed regulatory amendments are intended to implement the legislative change.

*John G. Parrish, Ph.D.  
Executive Officer*

### Revegetation of Sulphur Bank Mercury Mine

*Continued from page 5*

lime/organic while toyon performed best with the addition of lime/organic or organic. There were no significant differences in foothill pine or scrub oak growth among all soil treatments.

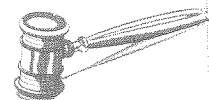
During September 1996 monitoring, OMR found that plants installed on the east tailings piles had relatively low mortality when compared to plants installed on the shoreline plots. Many shoreline plantings died during the summer. One possible reason for the mortality here is due to the heavy infestation of weeds and depletion of available water. OMR may test weed mats in Phase II. Phase II plots will test a greater diversity of plants and use plants grown from seed collected on site. These plants include western red, toyon, scrub oak, deerweed, foothill pine, bush monkeyflower, blue wild-rye, and squirreltail (*Elymus elymoides* syn. *Sitanion hystrix*).

Ongoing work at the University of California, Davis is involved with identification and propagation of mycorrhizal symbionts from the mine and laboratory experiments regarding the effects of arsenic on phosphorus uptake by plants.

*Mary Ann Showers,  
Environmental Specialist*

## Amador County Update

Effective Sept. 12, 1996, authority to approve reclamation plans was returned by the State Mining and Geology Board to Amador County, following certification by the board of the county's revised surface mining and reclamation ordinance. As reported in an earlier issue of the *SMARA Update*, the authority to approve reclamation plans in the county had been assumed by the board in February 1996, after the county did not incorporate amendments to address identified deficiencies in their proposed ordinance within the statutory 90-day period.



Under SMARA Section 2774.5, the board must allow 90 days after a finding of ordinance deficiency for a lead agency to revise the ordinance in conformance with SMARA. If a revised ordinance is not received within this time period, the board is required to assume authority from the lead agency for reviewing and approving reclamation plans. This section also allows for a second 90-day revision period if the board finds that an initial revision was not adequate.

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### 1997 SMGB Meeting Dates

Jan 16	Jul 10
Mar 13	Sep 11
May 15	Nov 13

*For information on meeting times and locations, contact the SMGB Office at (916) 322-1082.*

## "Emergency" Regulations No Longer Required For Fees Schedule

Effective Jan. 1, 1997, the requirement that surface mine reporting fees be adopted annually as an emergency regulation by the State Mining and Geology Board has been removed. Assemblyman Keith Olberg's (R-Victorville) AB 1373 (Chapter 365, Statutes of 1996) amends Public Resources Code section 2207 to provide the board with the option to establish the fee regulations under the nonemergency process, which still includes a public review process and public hearing.

This change will remove the need to hear a regulatory package twice, first as an emergency and then in a formal, clarifying adoption of those same regulations. The option to adopt the fees schedule by emergency remains, if necessary.

### Amador County Update

*Continued from page 6*

Disputed provisions of the ordinance were satisfactorily resolved in a meeting attended by Amador County's Stephanie Moreno, chairwoman of the board of supervisors. Representatives of the county, the board, and the Department's Office of Mine Reclamation worked together to reach agreement on numerous provisions of the ordinance, resulting in an ordinance that was acceptable to the board and subsequently certified as

meeting the minimum requirements of SMARA.

There were no reclamation plans submitted by Amador County operators to the board for review and approval during the temporary (seven-month) suspension of county jurisdiction.

*Dennis J. O'Bryant,  
Assistant Director*

**GET INVOLVED...**If you have an idea for a short story, would like to submit an article for the *SMARA Update*, or would like to request coverage of a particular subject matter, please contact OMR by telephone at (916) 323-9198, fax (916) 322-4862.



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## SMARA Update Mailing List

If you would like to receive a copy of the *SMARA Update*, or if you would like to make a mailing list correction to an existing subscription, please complete the information below and return it to OMR at 801 K Street, MS 09-06, Sacramento, California 95814.

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Director Lawrence J. Goldzband  
Chief Deputy Director B.B. Blevins  
Deputy Director Pat Meehan  
Assistant Director for OMR Dennis J. O'Bryant  
Newsletter Editor: Deborah Herrmann

## Coming in the spring issue of the *SMARA Update*... "Lead Agency Award Winners"

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